

MFC-F (V Series) INSTALLATION MANUAL



CONNECT2CAR

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MFC INSTALLATION MANUAL

Rev C, Issue 2

GENERATION III CAR CONTROL SYSTEMS

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1. INTRODUCTION

This document describes the installation outline and detail for the Connect2Car MFC also known as the Multi Function Controller Module is designed to provide multi-purpose solutions for real-time control and management of vehicle accessories. The Multi Functional Controller is a new type of flexible dynamic controller system geared specifically towards car accessory management. The heart of the MFC unit lies in the flexible user configurable software management and control system. Using a cell phone, PDA or CarPC Computer system, the user or installer can specifically control any accessory in any manner they wish, or use known preconfigured packages. Using the selected configuration packages, the controller device (phone, PDA e.g.) establishes a two-way communication with the hardware unit in the vehicle, and provides the user with virtual dashboard of their controls of interest, based on their configurations. Furthermore, the rich user interface skins also provide a more customized experience and local personalization to taste.

1.1 Disclaimer

The information contained in this document is accurate at time of release. However, as Connect2Car Inc, is committed to continued research and development activities, these specifications may change from time to time.

The present manual by Connect2Car Inc reflects the present state of the art of the products described therein. We have endeavored to give a description that is as complete and clear as possible in order to make work with our products as easy as possible for you. All the same, the manual may contain technical inaccuracies and typing errors. As a result of the rapid advance in the art, we must also reserve the right to incorporate technical alterations and developments without separate advance notice.

That is why Connect2Car Inc, does not give any warranty for the contents of the manual and for its continuing applicability. Nor is Connect2Car Inc. liable for any loss that might result from consultation of this manual. Particularly, Connect2Car Inc is not liable for damage, nor indirect damage (including damage caused by financial loss, and similar consequences), arising from the use or improper use of this manual, not even in the case where it was pointed out to Connect2Car Inc. or an agent of Connect2Car Inc. that such damage might be sustained.

Contact your Connect2Car representative, should you require clarification on information contained in this document or to request of copy of the latest version of this document. You can also visit www.connect2car.com for all the latest information/product manuals and documentation.

1.2 Copyright

The Connect2Car MFC Installation Manual is copyright by Connect2Car Inc. with all rights reserved. No part of this manual may be reproduced in any form without the prior written approval of Connect2Car Inc.

1.3 Safety Issues

It is recommended that you read these simple guidelines carefully before use, to ensure the safe operation of the module. The MFC should be installed by a professional automotive electronics installer.

The fact that there is unlimited control through the SOFTDASH interface software could give rise to one putting the accessories in and unconditional or dangerous state.

(e.g. cranking the ignition of a manual transmission vehicle in gear, controlling moving parts without caution, e.g. window, door poppers, hydraulics, linear actuators, etc...) Because of this unforeseen multi-functionality, Connect2Car, Inc. CANNOT VALIDATE NOR ENSURE THAT ANY OR ALL SAFETY REQUIREMENTS ARE MET DURING INSTALLATION AND THEREFORE ACCEPTS NO RESPONSIBILITY FOR THE INSTALLATION OR LOSS CAUSED BY THE INSTALLATION OR USE OF THE MFC MODULE AND THE SOFTDASH INTERFACE.

Below are outlined safety features implemented in the MFC to minimize risk of damage or unwanted use or control of an accessory with the MFC.

1.3.1 RECORDING AND SAVING THE INSTALLATION WIRING SETUP

The first thing you “user or installer” should do during installation is to label the installation wiring in the SOFTDASH “Installer Wiring” menu. This automatically uses this information to remind you of accessory configuration mismatches. This also serves as a good reference point if you were to change that accessory control in the future. Most times when people go to a different installer to install or change some wiring in their vehicles, the installer completely rips out and rejects the old wiring because it wasn’t done by them, and charges for a totally new job. The main reason being that they do not want to start retracing or following somebody else’s wiring. Sometimes the previous job might be obviously bad. However, this installer menu helps to share this installation data between old and new installers. You can input detailed information about the wire, its color, type, comments on its usage/connection etc. This helps to refresh things later, and also it is used to remind you when changing controls in the SOFTDASH interface.

1.3.2 SIMULATION MODE FOR RECIPES:

If you are going to be configuring or trying out a custom recipe that is not endorsed by Connect2Car, make sure you test it out in the software simulation mode and observe and make sure the output effects on the accessory indicators are what you expect. If you are not sure, consult your installer to verify or test the Recipe, based on your current car Installation/configuration. ALSO MAKE SURE TO CHECK THE ACCESSORY SETTINGS OF EACH RECIPE BEFORE YOU USE THEM. THE ACCESSORY SETTING IN THE RECIPE HAS TO MATCH THE SAME ACCESSORY LOCATION INSTALLED IN YOUR VEHICLE. E.g. using a recipe from somebody that runs a door controller accessory on ACC 1, might do something else in your car if a different accessory is installed on ACC 1 in your car. You will have to check your installation wiring diagram to make sure ACC 1 in your car runs the door lock control, or map it to the correct accessory output.

1.3.3 ACCESSORY TIMEOUT FEATURE:

The accessory timeout feature forces the MFC unit to turn off any given accessory, based on its timeout setting. This is to safeguard against unwanted effects that can be caused by accidentally trying out or unexpectedly using an unknown or badly configured Recipe (Accessory control configuration setting). Before you try out or activate any recipes, make sure you configure the safety timeout settings of each of the MFC accessory outputs. The time out settings should reflect a realistic timeout of the maximum safe time that accessory should be activated. Default setting is 5 seconds for all the accessory outputs.

It is also recommended that you use very short timeouts for accessories that control electro-mechanical devices or features e.g. ignition, windows, sunroof, linear actuators etc.

1.3.4 LOST CONNECTION SETTINGS

The SOFTDASH interface by default will automatically turn off all the accessory outputs once the user control device has been disconnected either via data cable or is out of Bluetooth connection range. This setting can be over ridden from the configuration settings. It can be configured per accessory and a [WAIT FOR RECONNECT] time can be set so as to control how long the unit will wait for the user before engaging into the safe mode. It is recommended that you do not disable the safe mode for accessories that control electro-mechanical devices or features e.g. ignition, windows, sunroof, linear actuators etc.

1.4 Technical Support

For all technical support please contact Connect2Car Inc. via support@connect2car.com. Your questions will be prioritized and responded to in a professional and prompt manner. Please also check out the FAQ section on the website at www.connect2car.com

1.5 GLOSSARY OF TERMS AND ABBREVIATIONS

ABBREVIATION	DESCRIPTION
MFC	MULTI-FUNCTION-CONTROLLER UNIT
OEM	ORIGINAL EQUIPMENT MANUFACTURER
GND	ELECTRICAL VOLTAGE GROUND REFERENCE POINT
PDA	PERSONAL DIGITAL ASSISTANT
FAQ	FAVORITE ASKED QUESTIONS

2. SYSTEM OVERVIEW

The MFC accessory customizable functionality is presented as vehicle data called RECIPES. In the recipe you make a series of steps, and say what happens or gets activated through each step. You set these based on timing (e.g. max time, min time etc) or tachometer reading (e.g. if below certain RPM's, if above certain RPM's e.g.)

One can create recipes for practically almost any purpose since the hardware interface to the vehicle is a universal blank multi-functional control device that has standard input and output interfaces to most vehicles. The hardware unit performs remote functional instructions contained in the Recipes. These Recipes are sent over the wireless or wired link at runtime command by the user. These Recipes are also saved locally as XML (Extensible Markup Language) formatted data files on the device, which describe the functionality of the accessory.

The user interface to the vehicle is on the smart phone device. The mobile device or PC acts as a tool to hold, configure and deploy the *recipes* which are actually run in real time on the hardware controller while reporting status of activities back to the smart phone device. Recipes can be made, shared or customized on the mobile device, and are created to fit the interface of the accessory to be managed and also the functionality based on user interaction.

Sample recipes include Car Alarms, Keyless Entry; Tachometer Shift light, Turbo timers, Strobe/Emergency flashers, Engine cut-off, Window rollup/down, Remote Starter, Fuel/Ignition Cut-off etc.

Administrators can setup package of Recipes for users/installers. E.g. Recipe packages with Recipes specifically setup for a Ford Mustang security system installation, a custom Turbo timer Recipe, hydraulics control recipe, or even a custom combo.

2.1 POSSIBLE SETUPS WITH THE MFC

... DEVICES RUNNING SOFTDASH INTERFACE SOFTWARE

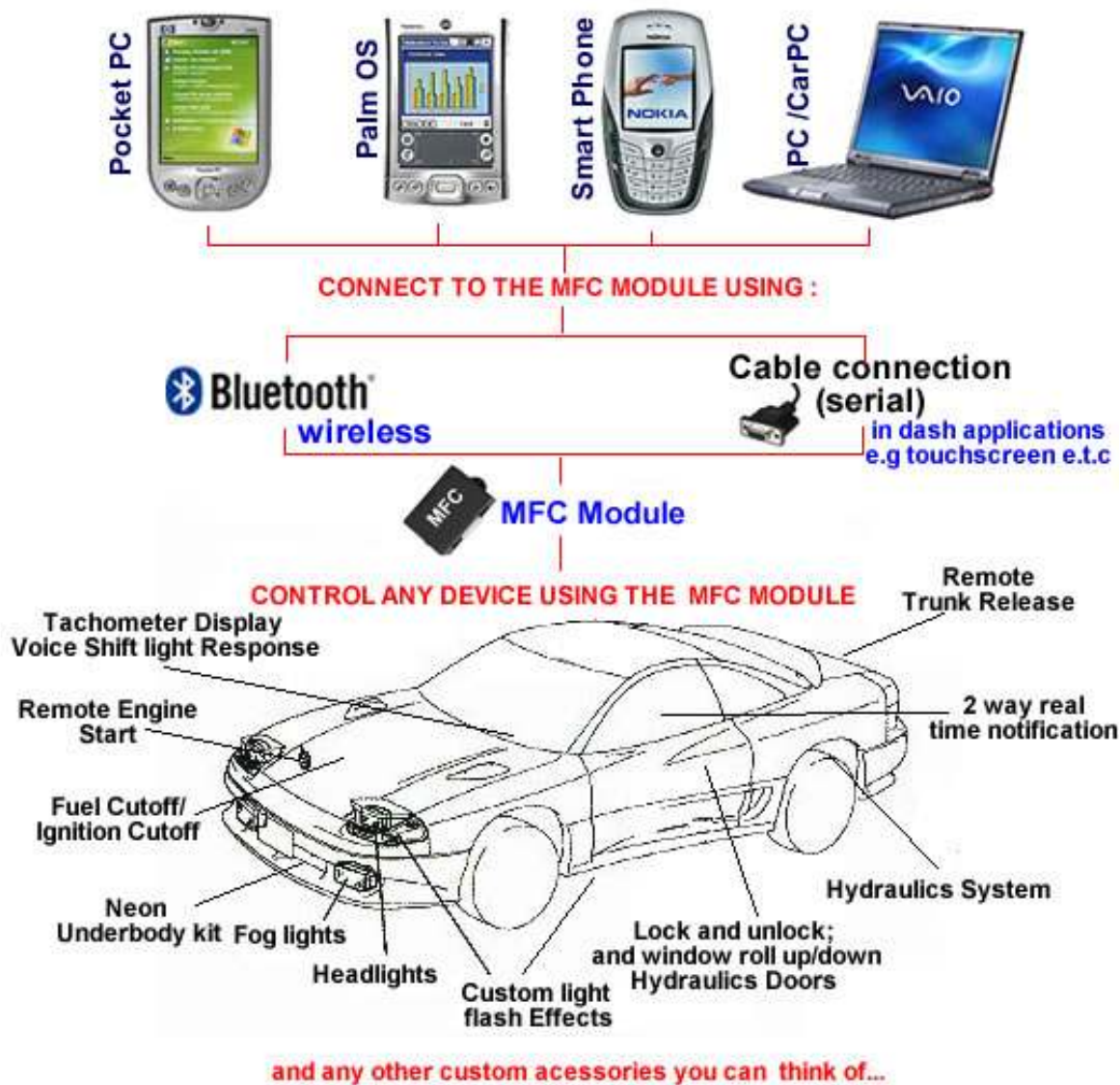


Figure 1: Overall MFC Capability

NOTES:

- Refer to the Software Manual to see a list of compatible phones, PDA's and PC devices. Also visit www.connect2car.com for the latest updates in compatibility of devices.

2.2 PHONE INTERFACE SETUP

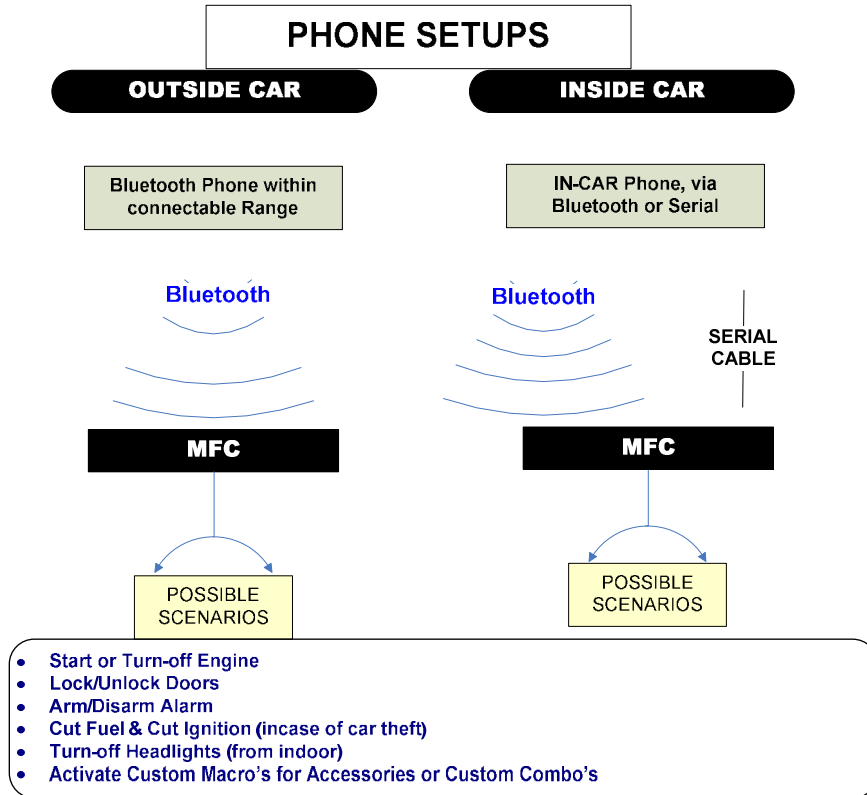


Figure 2: POSSIBLE PHONE INTERFACE CONFIGURATIONS

2.3 PDA INTERFACE SETUP

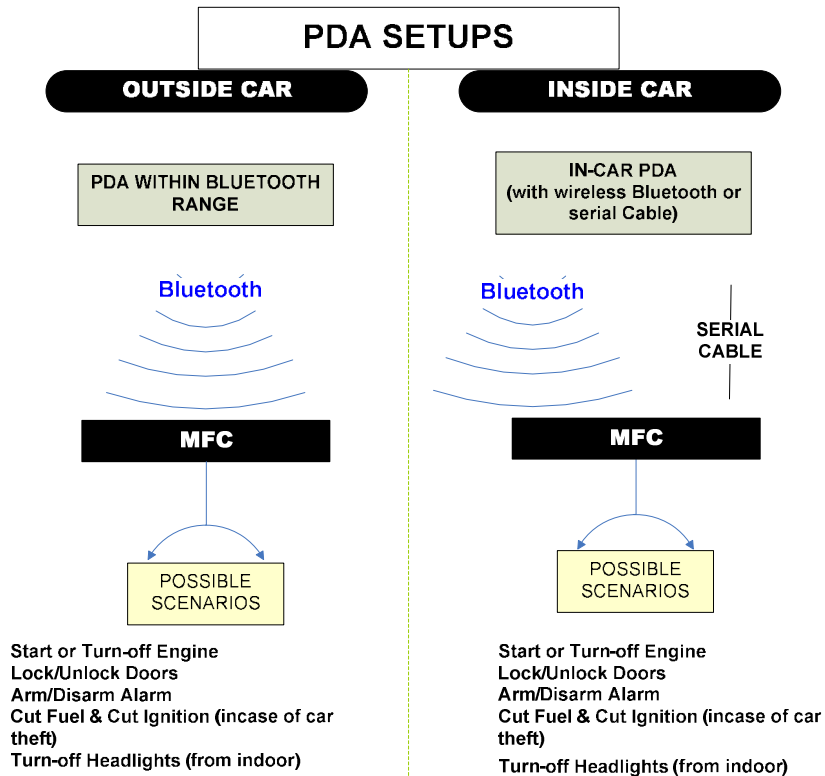


Figure 3: POSSIBLE PDA DEVICE CONFIGURATIONS

2.4 PC INTERFACE SETUP

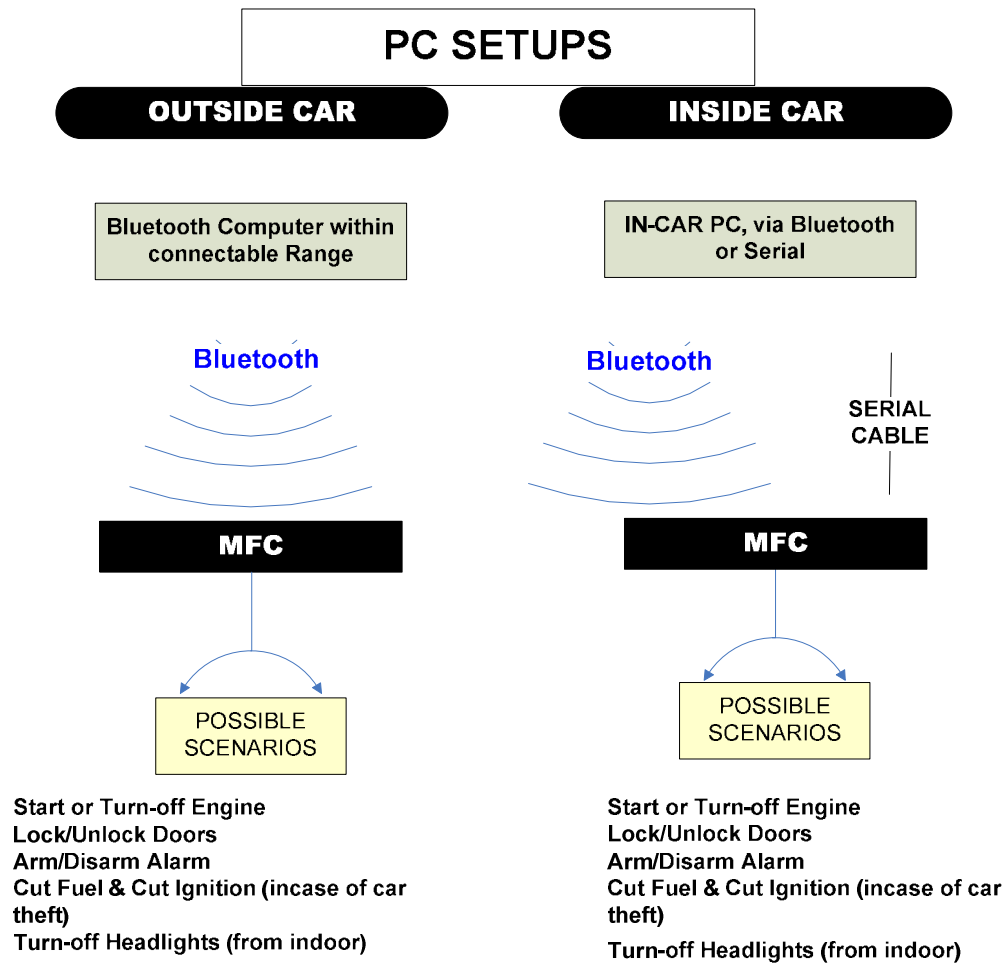


Figure 4: POSSIBLE PC/CARPC CONFIGURATIONS

NOTES:

- Refer to the Software Manual to see a list of compatible phones, PDA's and PC devices. Also visit www.connect2car.com for the latest updates in compatibility of devices.

3. MFC FEATURES

3.1 GENERAL FEATURES:

- 8 outputs - 4 are programmable accessory outputs (ACC 1-4)
- (ACC 5-8 are negative triggers ONLY these are not programmable)
- Tachometer input
- Bluetooth Interface
- Serial Interface
- USB charger port, for mobile phone or PDA devices with USB charging cable
- Status/Indicator LED's showing power, active serial or Bluetooth Data status

3.2 DETAILED SPECIFICATIONS:

ACCESSORY CONTROL	ACC 1-4	+/- Internal Relay (1-4) Output (Max 12v, 30A).
	ACC 5-8	Negative Triggers (-500mA max) use external relays if needed.
POWER	12-18V	
USB CHARGING	5V (max 5amps)	
Bluetooth	Serial Port Profile (SPP) Only Antenna Power Class 2 (50ft)	
Serial Port	Mechanical: 6' 9-pin DSUB (FEMALE) connector	
PHYSICAL DIMENSIONS	MFC UNIT	6.75" x 4" x 1.25"
	Bluetooth Antenna Module	3" x 1.5" x .75" (with a 3' cable)

3.3 GENERAL WIRING HARNESS CONFIGURATION:

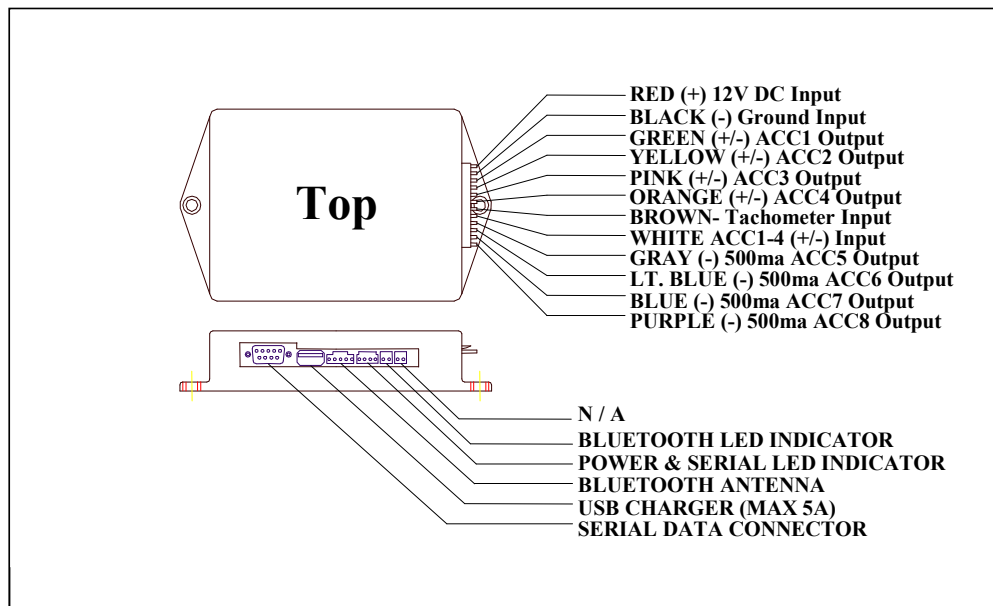


Figure 5: MFC CONNECTOR DIAGRAM

3.4.1a	RED	+12V DC MAIN POWER USE 7 AMP FUSE
3.4.1b	BLACK	(-) CHASSIS GROUND INPUT
3.4.1c	GREEN	ACC1 30 AMP(+) OR (-)OUTPUT
	YELLOW	ACC2 30 AMP(+) OR (-)OUTPUT
	PINK	ACC3 30 AMP(+) OR (-)OUTPUT
	ORANGE	ACC4 30 AMP(+) OR (-)OUTPUT
3.4.1d	BROWN	TACHOMETER INPUT
3.4.1e	WHITE	ACC(1-4)SOURCE INPUT(+)OR(-)
3.4.1f	GRAY	ACC5(-) OUTPUT / 500ma
	LT.BLUE	ACC6(-) OUTPUT / 500ma
	BLUE	ACC7(-) OUTPUT / 500ma
	PURPLE	ACC8(-) OUTPUT / 500ma

Figure 6: Main Connector (P) Detail

3.4 CONNECTOR AND WIRING DETAILS

3.4.1 MAIN HARNESS 12 PIN CONNECTOR

3.4.1a Red (+) Constant Power Input

This wire supplies the main power for the MFC and must be fused. Before connecting make sure P2-Black is wired to a solid chassis ground.

3.4.1b Black (-) Chassis Ground

Connect this wire to a paint free metal chassis ground. Make sure wire has a solid connection and does not move around

3.4.1c Green/Yellow/Pink/Orange ACC1-4 (+) or (-) Outputs

These connectors are output from the 4 MFC internal relays (rated up to 12v @ 30amps peak). These wires will be connected to the vehicle accessories such as door locks, radio turn on, trunk release, etc... They can all either send a (+) or (-) Signal depending on what the ACC source input wire is connected to. (P8-white wire) See pg10 for details.

3.4.1d Brown -Tachometer Input

With this wire connected to the vehicles tachometer signal wire, it will allow you to get an RPM read out on the Connect2Car SOFTDASH Software running on your controller device (e.g. phone, PC or PDA, etc). The RPM can be used in REMOTE START recipes to synchronize with the RPM while starting (as well as using a limited pulse time). It can also be set up to activate any specific output based on the RPM (e.g. activate/deactivate an output below or above a desired RPM level). For accurate performance of the tachometer readings, the tachometer must be calibrated from the SOFTDASH software interface.

3.4.1e White (+) or (-) ACC 1-4 Source Input

This is the input for the internal relays that control P3, P4, P5, and P6. If connected to a 12V+ the outputs of Acc (1-4) will then be 12V+. If connected to a (-) chassis ground the outputs will then be (-). This wire must be fused with a 30A max fuse to protect the vehicle and MFC board in case of a short.

3.4.1f Gray/Light Blue/Blue/Purple ACC 5-6 / 500ma (-) Outputs

These four wires will supply a 500ma (-) output and in most cases will require the use of external relays. You can use these to connector to a direct accessory that requires a 500ma (-) or less trigger. For any other type of control, these outputs should be coupled with an external relay, where by the relay coil is grounded by this output. See section 0, page 16 for details.

3.4.2 BLUETOOTH ANTENNA CONNECTION

Connect the Connect2Car MFC Bluetooth® antenna to this port (*optionally supplied in the box*). Mount the Bluetooth antenna unit in a suitable location in the vehicle that is not closed or boxed in by metal panels. A suitable location is somewhere on/above the dashboard or panel height level or at least window/glass level for best reception. With the Bluetooth antenna plugged in, you can now perform all your MFC controlling via the wireless Bluetooth interface. The led indicators on the Bluetooth antenna indicate active Bluetooth® status. Red only (indicates power). Blue/flashing colors indicate live Bluetooth connection.

Note: The Bluetooth® data connection will be overridden / disabled if the serial data cable is plugged in and the controlling computer/device has the serial port activated.

3.4.3 SERIAL DATA CONNECTOR

This gives you local serial port control to the MFC device. Use standard DB9 (Female) cable provided in the box. An active serial port data connection with the MFC unit overrides the Bluetooth® connection.

Note: The Bluetooth® data connection will be overridden and disabled if the serial data cable is plugged in and the controlling computer/device has the serial port activated.

3.4.4 USB Chargers

The PDA/PHONE charger connector will charge devices with a USB charging capability. The charger can handle up to 5A maximum @ 5v. Check your device manufacturer for details.

3.4.5 POWER AND SERIAL DATA LED INDICATOR

The LED's can be mounted anywhere for visible indication. The green LED signifies a power connection and the yellow LED signifies active serial data connection. If the yellow LED lights up, the Bluetooth® connection will be automatically disabled/bypassed (See section 0, pg 12)

3.4.6 BLUETOOTH® LED INDICATOR

The alternate Bluetooth® LED indicator also indicates an active Bluetooth® connection. This can also be mounted any where you wish to indicate a visible Bluetooth® connection.

4. COMMON INSTALLATION SETUP EXAMPLES WITH THE MFC

4.1 PRIMARY CAR CONTROL

MFC – V1

MFC	PIN#1	+ 12V DC	RED	POWER
	PIN#2	- GROUND	BLACK	GROUND
	PIN#3	ACC 1 OUT (max24V 30A)	GREEN	WINDOWS UP
	PIN#4	ACC 2 OUT (max24V 30A)	YELLOW	WINDOWS DOWN
	PIN#5	ACC 3 OUT (max24V 30A)	PINK	SUNROOF OPEN
	PIN#6	ACC 4 OUT (max24V 30A)	ORANGE	SUNROOF CLOSE
	PIN#7	TACHOMETER (In)	BROWN	TACHOMETER INPUT
	PIN#8	ACC (1-4) Source + / -	WHITE	PINS (3-6) / ACC (1-4) SOURCE INPUT (+) OR (-)
	PIN#9	ACC 5 OUT (-ve 500ma)	GRAY	RADIO POWER
	PIN#10	ACC 6 OUT (-ve 500ma)	LT. BLUE	DOOR LOCK
	PIN#11	ACC 7 OUT (-ve 500ma)	BLUE	DOOR UNLOCK
	PIN#12	ACC 8 OUT (-ve 500ma)	PURPLE	TRUNK RELEASE
DB9(M) SERIAL PORT			CABLE	CONNECT TO DB9(M) (9 PIN MALE SERIAL PORT ON PC)

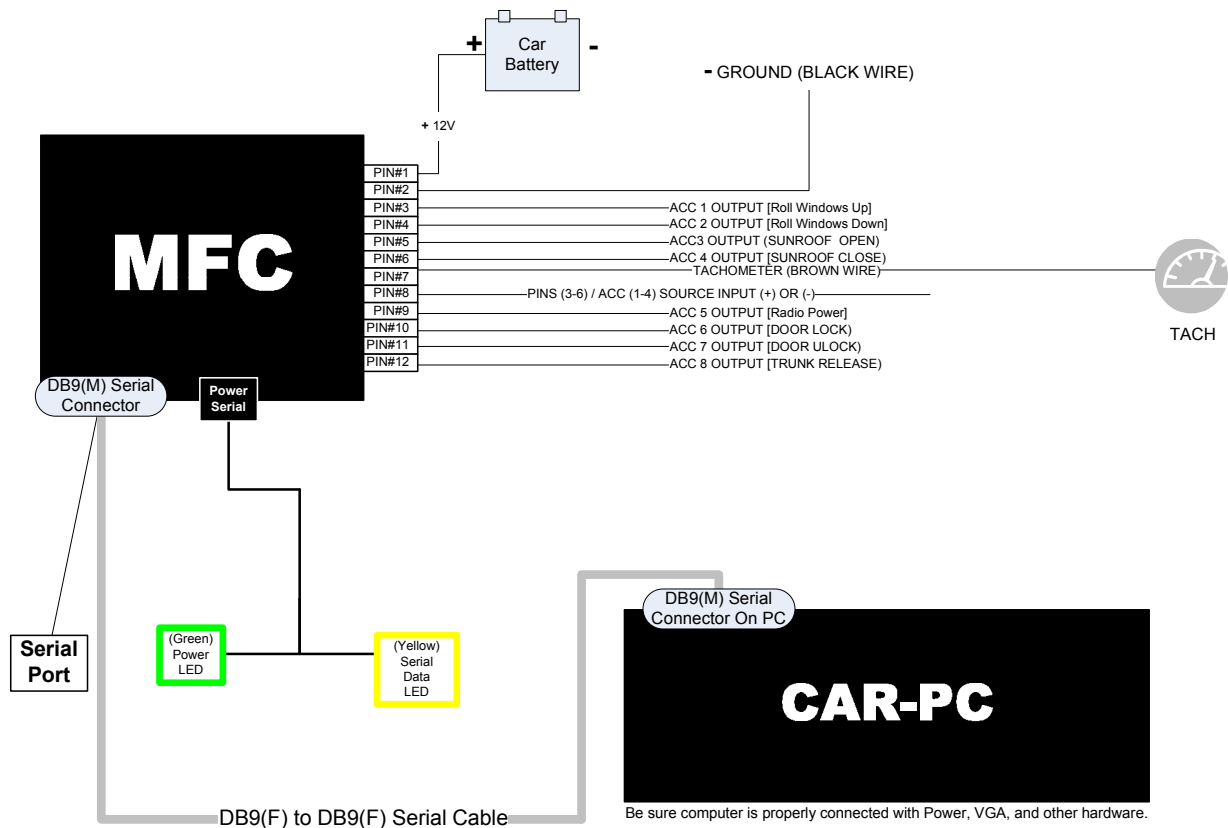


Figure 7: MFC Example: Simple setup

4.2 PRIMARY CAR CONTROL (WIRELESS)

MFC – V2

MFC	PIN#1	+ 12V DC	RED	POWER
	PIN#2	- GROUND	BLACK	GROUND
	PIN#3	ACC 1 OUT (max 24V 30A)	GREEN	WINDOWS UP
	PIN#4	ACC 2 OUT (max 24V 30A)	YELLOW	WINDOWS DOWN
	PIN#5	ACC 3 OUT (max 24V 30A)	PINK	DOOR LOCK
	PIN#6	ACC 4 OUT (max 24V 30A)	ORANGE	DOOR UNLOCK
	PIN#7	TACHOMETER (In)	BROWN	TACHOMETER INPUT
	PIN#8	ACC (1-4) Source + / -	WHITE	PINS (3-6) / ACC (1-4) SOURCE INPUT (+) OR (-)
	PIN#9	ACC 5 OUT (-ve 500ma)	GRAY	RADIO, A/C, or OTHER ACCESSORIES
	PIN#10	ACC 6 OUT (-ve 500ma)	LT. BLUE	TRUNK RELEASE
	PIN#11	ACC 7 OUT (-ve 500ma)	BLUE	ENGINE START
	PIN#12	ACC 8 OUT (-ve 500ma)	PURPLE	ENGINE CUT-OFF

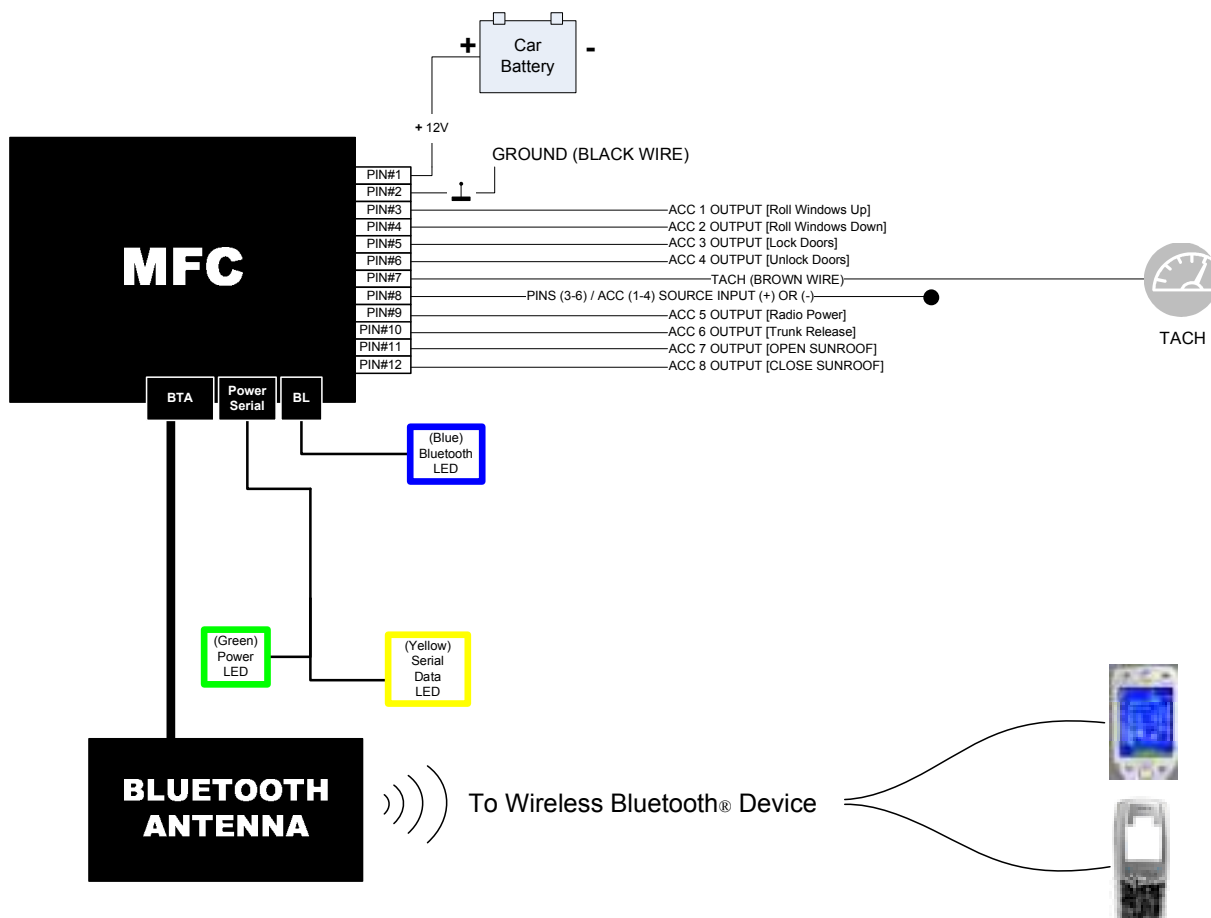



Figure 8: Direct MFC Example: Setup with Bluetooth Antenna add-on

4.3 CAR CONTROL (Alarm Style with Remote Start)

This is an example of a direct installation setup, however, in this setup; you waste a lot of accessory output connections, due to the intermediate sections needed to achieve a single functionality. Triggers in the picture are assumed to be setup depending on the purpose (i.e. positive controlled or negative triggered setups).

MFC – V3

UNIT	PIN#1	+ 12V DC	RED	POWER	 Powered by pin#8 (+or-) Use external relay if needed
	PIN#2	- GROUND	BLACK	GROUND	
	PIN#3	ACC 1 OUT (max24V 30A)	GREEN	WINDOW UP	
	PIN#4	ACC 2 OUT (max24V 30A)	YELLOW	WINDOW DOWN	
	PIN#5	ACC 3 OUT (max24V 30A)	PINK	FUEL – CUTOFF	
	PIN#6	ACC 4 OUT (max24V 30A)	ORANGE	ACC – CUTOFF	
	PIN#7	TACHOMETER (In)	BROWN	TACHOMETER INPUT – To the TACH wire on the ALARM DEVICE	
	PIN#8	ACC (1-4) Source (+ / -)	WHITE	PINS (3-6) / ACC (1-4) SOURCE INPUT (+) OR (-)	
	PIN#9	ACC 5 OUT (-ve 500ma)	GRAY	START ACTIVATION TO – Remote Start input wire on ALARM DEVICE	
	PIN#10	ACC 6 OUT (-ve 500ma)	LT. BLUE	ARM OUTPUT TO – Lock input wire on ALARM DEVICE	
	PIN#11	ACC 7 OUT (-ve 500ma)	BLUE	DISARM OUTPUT TO – Unlock input wire on ALARM DEVICE	
	PIN#12	ACC 8 OUT (-ve 500ma)	PURPLE	EXTRA OUTPUT FOR – (WINDOW, TRUNK RELEASE, SUNROOF, ETC....)	

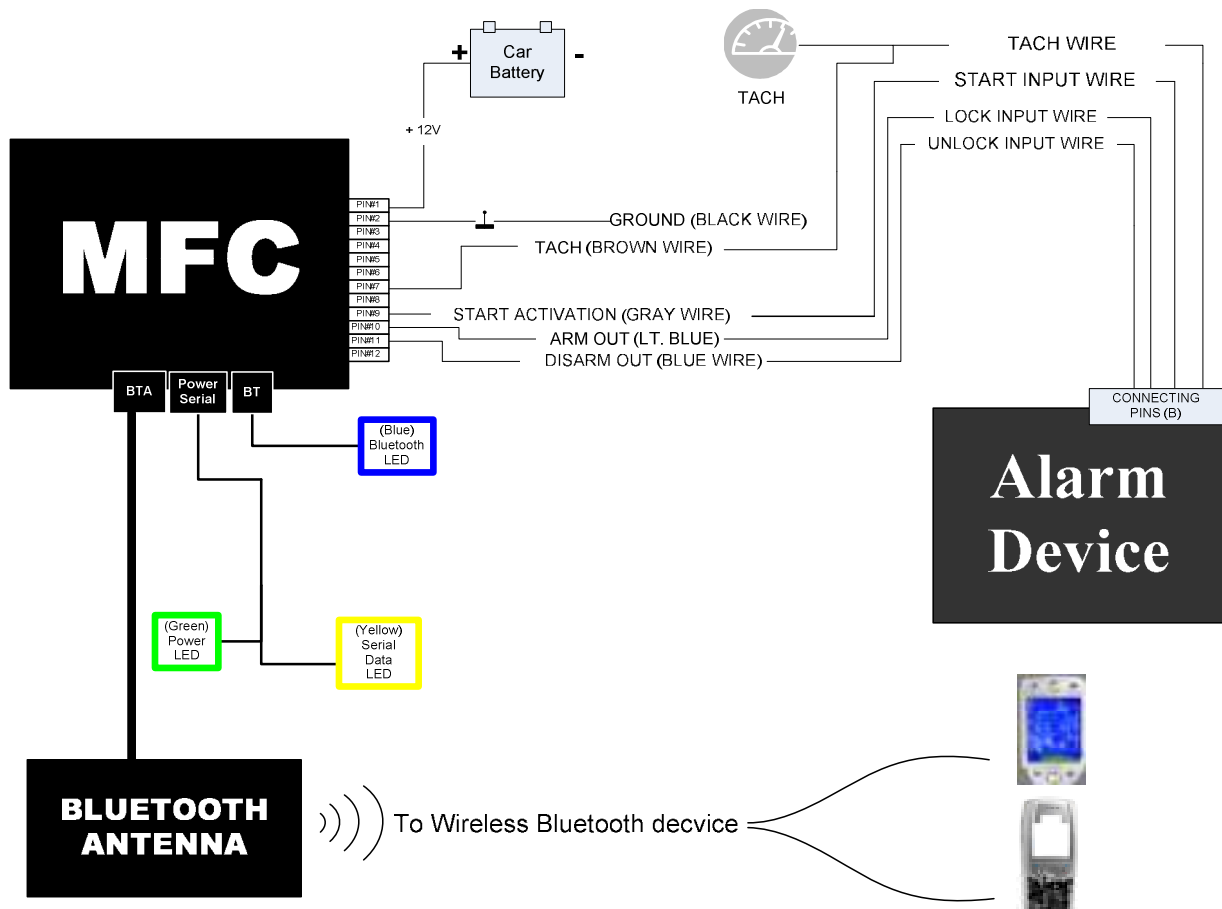


Figure 8: Direct MFC Example: Setup with Alarm add-on

4.4 CONTROL HYDRAULICS (Another unique way to use the MFC)

Being able to show off your MFC couldn't be better; this setup allows you to control your hydraulics or air suspension in your car through a cell phone. The diagram provided is based on a simple setup. You can use this setup if best applied to your car or configure your own.

WARNING

**HIGH POWER RELAYS MUST BE USED IF THE HYDRAULIC USES 24V & OVER 30 AMPS
HIGH POWER RELAYS MUST BE USED IF THE AIR SUSPENSION USES 24V & OVER 30 AMPS**

MFC – V2: HYDRAULIC CONTROL

(with the Bluetooth® Antenna)

M F C	PIN#1	+ 12V DC	RED	POWER	(USE HIGH POWERED RELAYS IF NEEDED)
	PIN#2	- GROUND	BLACK	GROUND	
	PIN#3	ACC 1 OUT (max24V 30A)	GREEN	FRONT WHEELS UP (LEFT & RIGHT)	
	PIN#4	ACC 2 OUT (max24V 30A)	YELLOW	REAR WHEEL UP (LEFT & RIGHT)	
	PIN#5	ACC 3 OUT (max24V 30A)	PINK	FRONT-RIGHT DOWN	
	PIN#6	ACC 4 OUT (max24V 30A)	ORANGE	FRONT-LEFT DOWN	
	PIN#7	TACHOMETER (In)	BROWN	TACHOMETER INPUT	
	PIN#8	ACC (1-4) Source + / -	WHITE	PINS (3-6) / ACC (1-4) SOURCE INPUT (+) OR (-)	
	PIN#9	ACC 5 OUT (-ve 500ma)	GRAY	REAR-RIGHT DOWN	
	PIN#10	ACC 6 OUT (-ve 500ma)	LT. BLUE	REAR-LEFT DOWN	
	PIN#11	ACC 7 OUT (-ve 500ma)	BLUE	RIGHT SIDE DOWN (FRONT & BACK)	
	PIN#12	ACC 8 OUT (-ve 500ma)	PURPLE	LEFT SIDE DOWN (FRONT & BACK)	

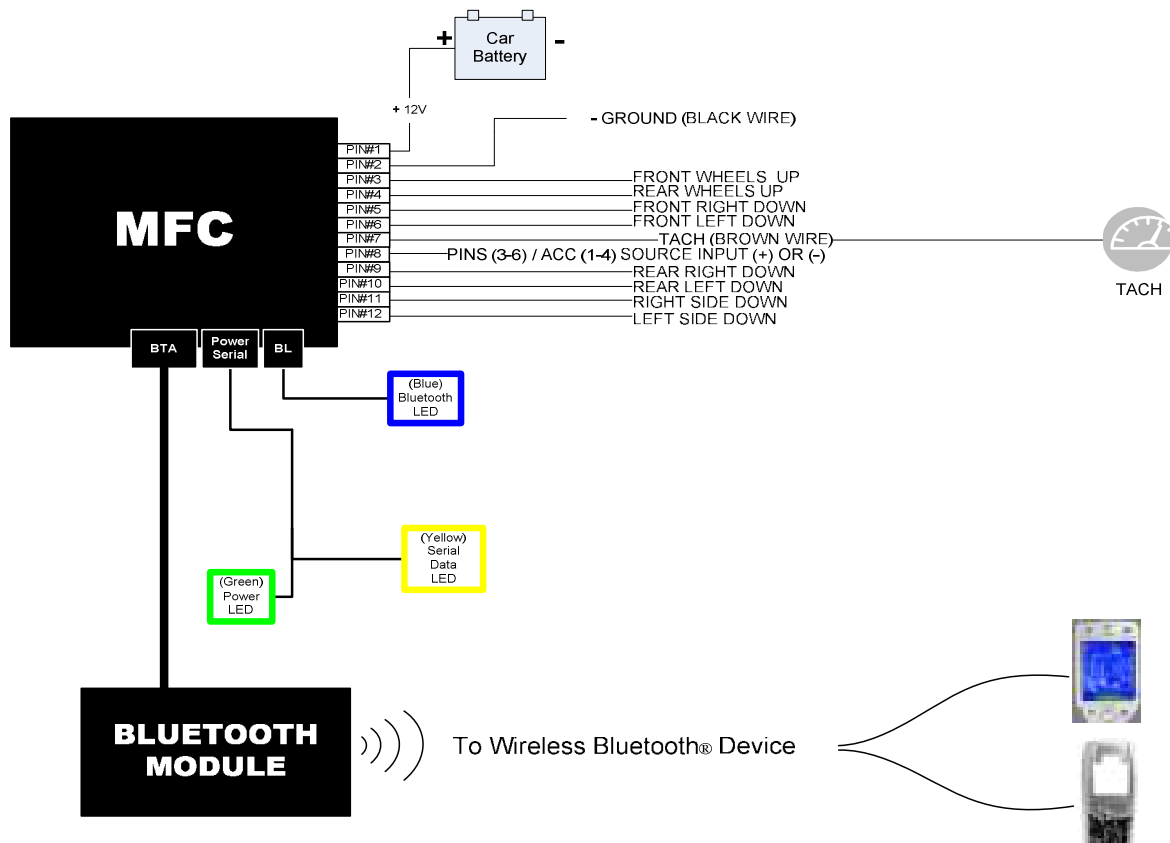


Figure 9: MFC Example: Setup as Hydraulics Controller

5. EXAMPLE ACCESSORY WIRING CONFIGURATIONS

Since the unit has the capability of controlling any 12V electronic device you want, possibilities are pretty much endless. Below are a few examples of the many things you can control. All the necessary software configurations for the accessory examples below are included with the SOFTDASH software interface. You can also make your own custom configurations for custom accessory controls (refer to the software manual).

5.1 REMOTE START ACCESSORY CONFIGURATION

The MFC can be used as a stand alone Remote Start or can also be used to activate an external remote starter unit. By using ACC (1-4) and setting the Black/Red Input wire to positive you can wire into the vehicles Ignition Harness to Remote start your car.

Making the right connections is important and should be done by a professional or a person who has a good understanding of the vehicle electrical system that they are working on. The recommended remote start configuration utilizes tachometer as well as timed remote start. The tachometer timing/calibration is the basis of the ignition crank, and the pulsed time out serves as the maximum possible crank time limit.

Connect2Car ACCEPTS NO RESPONSIBILITY FOR THE INSTALLATION OR CONFIGURATION OF THE REMOTE

START FEATURE IN A MANUAL TRANSMISSION VEHICLE. The fact that there is no guarantee that the transmission will be in a neutral position for manual transmission vehicles puts your or the car at risk of damaging/injuring ones self or others in the surrounding should the ignition crank while the car is in gear.

5.1.1 TRIGGERED REMOTE START

Setup any of the MFC accessory wires as a positive controlled or negative controlled accessory wire, depending on the type of trigger on the external remote start unit. Connect the final trigger wire to the trigger input of the remote start unit.

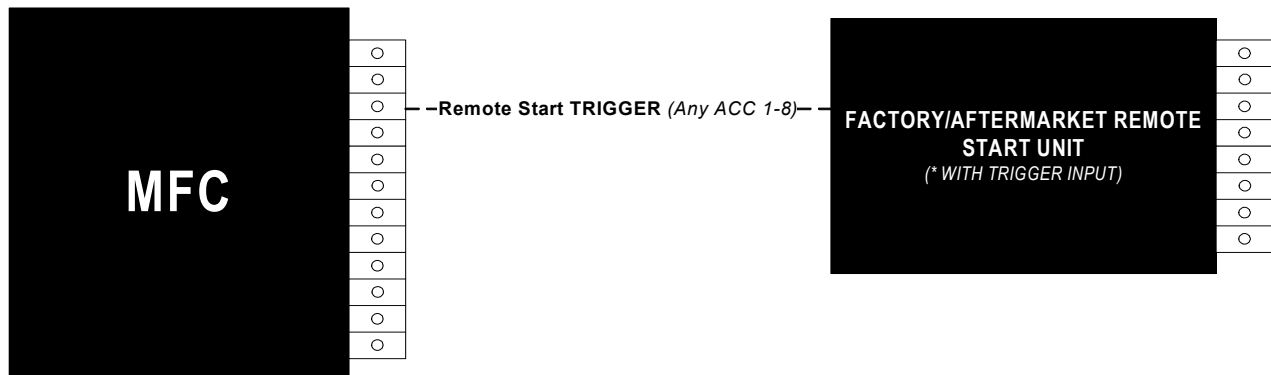


Figure 10: Triggered Remote Start

Setup the software configuration for a single pulse on that accessory wire. On the software, setup which convenient button on the device you want to use for the remote start.

- **SOFTWARE CONFIGURATION**

The single pulse Recipe is included in the default download package of the software. There is also a delayed single pulse recipe that makes sure you hold down the button for a minimum delay before the pulse will be triggered. You can use this if you want to filter random accidental key press on the phone. You can adjust all the timing delays as needed from the software interface.

For the trigger accessory line, set the maximum safety timeout for that line to be 1sec. (This means that no matter what recipe/accessory configuration is assigned to that line, the maximum time that output will be activated is 1 sec)

5.1.2 **DIRECT REMOTE START**

In this setup, the MFC directly interfaces with all the necessary wires needed for a remote Start, however in this configuration, you use up more accessory wires compared to the triggered remote start. Also note that for this configuration to work, some vehicles might require an ignition bypass kit to override an electronic chipped key or any other type of factory security override.

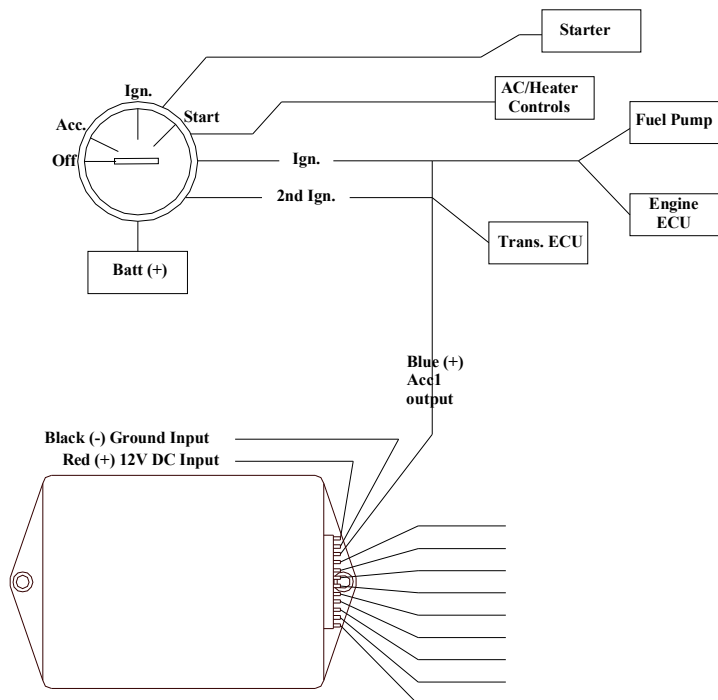


Figure 11: Direct Remote Start

- **Finding the Starter wire.**

The starter wire can be found in the ignition harness which will be coming off of the Key cylinder. This wire when tested will read 12V+ only when the key is in the crank/start position and will return to a ground (-) when the key is not in the crank/start position.

- **Finding the Ignition wire/wires**

The Ignition wire/wires can also be found at the ignition harness. Some vehicles may have more than one ignition wire and it is important that they all receive power in order for the remote start to work. When testing an ignition wire it will read ground (-) when in the key is in the accessory position and will be 12V+ when the key is in the run position and also in the crank position.

- **Finding the Accessory wire/wires**

The Accessory wire/wires are not needed in order for the remote start to work, however in order to turn on the Radio, Heater controls, and AC controls you will also have to power up the accessory wire/wires. When testing accessory wires they will read 12V+ when the key is in the accessory and run position, and will shut down and read ground(-) when in the crank position.

The figure below shows each wires reading in relation with the key position.

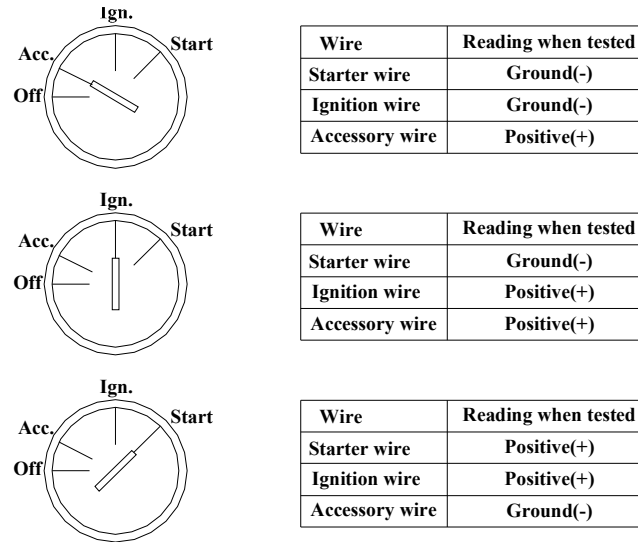


Figure 12: Ignition Key Positions

- **Tachometer wiring**

Connect the MFC tachometer wire to the cars tachometer output wire. Make sure you run the tachometer calibration on the SoftDash software to ensure optimal monitoring of the tachometer system.

- **SOFTWARE CONFIGURATION**

The direct Remote Start Recipe is included in the default download package of the software. There are two types of button control settings included with the package. One is a one touch remote start setup. Touch to Start, Touch to Stop, and the other is a 2 stage self controlled remote start whereby the first stage activates all the accessories, and the second stage cranks the ignition for a start, using tachometer monitoring as well as pulsed timeout.

For the trigger accessory line of the ignition wire, set the maximum safety timeout for that line to be 4 sec. (This means that no matter what recipe/accessory configuration is assigned to that line, the maximum time that output will be activated is 4 sec).

The other accessory lines can be set to infinite timeout or e.g. a 10minute timeout, if you want the remote start to shut down after 10mins.

5.2 DOOR LOCK/UNLOCK ACCESSORY CONFIGURATION

There are 3 main of door lock types and it is important to determine what type your vehicle has before making any connections. Incorrect connections may cause damage to the MFC or the vehicle electric system. The information provided is only a guide and may not be correct for your vehicle.

Type 1- Negative Trigger (-): Most Imports, newer General Motors, and newer Fords. With Negative trigger door lock style, factory relays are controlled by a negative/ground pulse from the switch or factory alarm module.

These wires can be found at the door lock switch, in the drivers or passenger kick panels, at the door lock relays, or at the factory security module.

Below is an example of a factory negative pulse switch, relays, and actuator setup. By using the factory relays you can avoid having to use your own, just simply connect one of the (-) outputs from the MFC to Lock and another one to Unlock as demonstrated below.

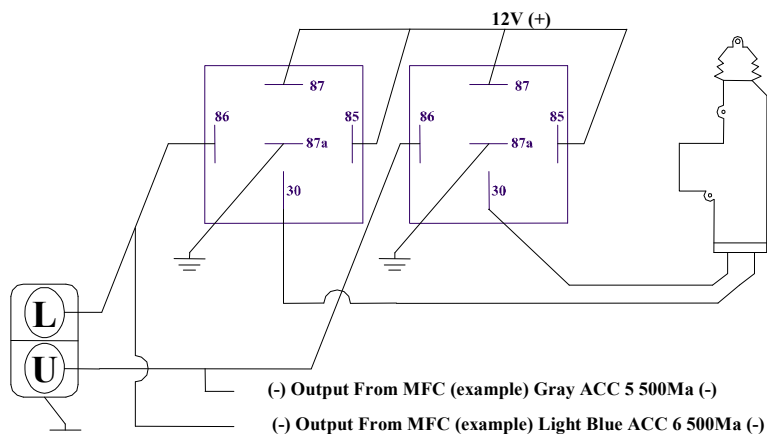


Figure 13: Connecting MFC to factory door triggers

5.3 MORE ACCESSORY CONFIGURATIONS

5.3.1 Parking Lights:

These wires can normally be found at the back of the switch in the kick panel running towards the rear of the vehicle, or at the light itself. When run through ACC 1-4, parking lights should be connected with an inline fuse based on the vehicle fuse ratings. Do not attempt to draw more than 30A directly from the MFC, use an intermediate RELAY. Also from software, it is recommended that you do not rapidly flash filament bulbs, as this can increase the wear and tear on the filament due to rapid expansion and contraction.

5.3.2 Radio Turn on:

By connecting the MFC to your accessory wire coming from the key cylinder you will be able to turn your radio and heater controls on with the car off.

5.3.3 Heater and Climate controls:

These accessories can be accessed easily from their respective outputs on the key cylinder.

5.3.4 Power windows/Sunroof:

You can wire up the windows to roll up and down with just the MFC. Window control should be done through a standalone window roll/up down module, or standalone sunroof control module. The MFC can trigger these modules into activation for the window controllers. Some cars already come with a factory window control system. E.g. most cars that control the windows when the driver turns the key in the door hole for a few seconds etc, can piggy back on the factory window controller, by just sending a longer pulse to the door lock line.

You can also control windows directly by using Relays(internal or external) to control window motors, however, it is not recommended, as the MFC does not have a safety voltage monitor to monitor motor current overload when the windows are completely rolled up. One would have to implement an external cutoff (even if the MFC is timed for the average rollup/roll down time). It is recommended you just use a standalone window module controller.

5.3.5 Trunk release:

If your vehicle has a power hatch/trunk release you can control it with your MFC by just triggering the trunk release line (either negative or positive triggered).

5.3.6 Air Ride or Hydraulic Suspension:

The MFC is a perfect replacement for those large switch panels. With Bluetooth, you will be able to stand outside the vehicle and control the whole air ride or hydraulic set up.

5.4 THE SKY IS THE LIMIT:

There is no limit of what you can control and with the Connect2Car Software on your Bluetooth® enabled cell phone or Bluetooth® enabled PDA all the outputs are fully programmable to use them whatever way you want. This unlimited customization should be done by a professional ONLY.

You can always work with preset packages that work to do specifically what you want. Visit www.connect2car.com to download specific configuration packages geared towards different unique configurations. Also, consult your local Connect2Car dealer or Installer for more details.



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